irregular polyhedral or cubical epithelial cells, and the epithelium of the sulcus externus and the sulcus internus, varying in form from pavement to cubical epithelium, merged into the reticular membrane from either side. In places remnants of hair-cells and rods, the latter thin and atrophic, were seen. The tunnel-space was obliterated. In one place, the zone made up by the second and third fourths of the basal turn of the cochlea, the papilla basilaris was replaced entirely by a simple layer of pavement epithelium. The tissue between the lamellæ of the lamina spiralis was remarkably deficient in nuclei and fibres. Here, also, the nerve fibres were few in number, this deficiency being especially marked in the region where there was the greatest atrophy of the papilla basilaris. The spiral ganglion was also atrophied in regions corresponding to the papilla atrophy, the nerve cells of the ganglion, entirely normal in appearance, being much diminished in number. The cochlear branch of the acusticus was atrophied, being about two-thirds of its normal diameter, and some of its fibres showed degeneration of the medullary sheaths and axis cylinders, whereas the vestibular branch was normal. The case then presents a disease process in the cochlea and the cochlear nerve without any involvement of the rest of the membranous labyrinth, the middle and outer ear being normal. Alexander distinguishes three grades of atrophy which were found in different regions in this case:

1. The papilla basilaris shows only slight histological changes. In the midst of nearly normal surroundings there is a limited disappearance of the sense cells (either of the hair-cells alone or hair and rod-cells).

2. The papilla is entirely atrophied, the sense cells and also the supporting cells having disappeared. (In the latter are included the cells of the spiral sulci and the cells of Hensen, Boettcher, and Claudius.) The papilla is replaced by a pavement epithelium which covers the endolymphatic surface of the basilar membrane. As etiological factors in producing this condition of the labyrinth, Alexander points out the arterio-sclerosis of the individual and the complicating cachexia of his tongue-carcinoma. The article is illustrated with plates containing twenty-nine figures which show excellently the various degrees of pathological change above described, but it is to be regretted that there are not more of the more normal parts of the cochlear organ figured for comparison.—W. A. L.

The Closure of Retro-auricular Openings by Means of Subcutaneous Injections of Paraffin.—Hugo Frey (*Archiv für Ohrenheilkunde*, Band lvi. Heft 3 und 4). The persistence of a retro-auricular opening following the radical operation is, according to Frey, to be avoided in the majority of cases, although he believes, following the teaching of Politzer, that in those cases with tendency to cholesteatoma formation, where a recurrence of the process is to be expected, a permanent opening is desirable. With the exception of this class of cases a closure of the retro-auricular opening should be attempted either at the time of the operation or at some later period by a suitable plastic. If, however, the opening persists, a convenient method of closing it is by means of subcutaneous injections of paraffin around the borders of the opening. The method of injecting the paraffin is that first suggested by Gersuny. The paraffin is injected into the subcutaneous tissues around the opening by means of an ordinary subcutaneous syringe. (Frey uses the solid glass syringe of Luer.) The paraffin used (unguentum paraffini) must be of a salve-like consistency and have a melting point of 40° C. As a practical method Frey finds that to take about equal quantities of hard paraffin and liquid vaseline and mix them over a hot-water bath, and then vary the amount of the two constituents until a drop allowed to fall on the hand becomes immediately of a salve-like constituency, is perfectly satisfactory. The paraffin thus prepared is injected by inserting the needle of the subcutaneous syringe about 5 cm. outside of the border of the exenterated cavity in two or three places around the circumference. To keep the paraffin from filling the whole posterior opening of the cavity, this is plugged with gauze from the bottom up to within a distance of 5 cm. from the mouth of the cavity. After the borders of the opening have been brought together by means of the paraffin injections a real closure may be effected by refreshing the edges of the approximated borders, which then unite together. The process of injecting is somewhat painful to the patient, and therefore, in some cases, it is advisable to inject Schleich's mixture first.

Cases where there is only a thin layer of cicatricial tissue closely adherent to the underlying bone around the opening are not adapted to this method, and, unless there is a certain amount of movable skin with its subcutaneous tissue in this situation, this method cannot be used safely for fear of pressure necrosis. Openings larger than 1.5 cm. in diameter are also not adapted for this method.

Frey reports, briefly, seven cases of persistent retro-auricular openings closed by paraffin injections, and gives photographs of the condition before and after treatment.—W. A. L.

The Voice as a Means of Testing Hearing.—(*Klinische Vorträge aus dem Gebiete der Otologie*, etc., Band v., Heft 7.) The first part of Treitel's monograph is a criticism of the work of Oscar Wolf, which he believes to be inaccurate in some points. The assertion of Wolf, that the non-perception of various test words is directly proportionate to the size of the perforation in the membrana, can no longer be considered to hold good, the degree of non-perception being dependent rather upon the amount and kind of the fixation of the ossicular chain.

That the higher in the scale the fundamental tone of a consonant is the more easily it will be perceived, that those consonants which come nearest in their clang-color to the so-called simple tones are most difficult to comprehend, and that those the clang-color of which is composite of a number of harmonic tones are more easily perceived, are facts resting upon data, according to Treitel, to be explained largely by the disposition of the individual, his ability to concentrate his attention, his imagination, etc. The question is a psychical as well as a physical one.

For the exact differentiation of affections of the middle ear from those of the inner ear Treitel insists that the use of tuning-forks is essential, but that some probability of the former is shown by the more or less complete inability of a patient to hear such words of low pitch as "mutter," "uhr," "zucker," etc., and that the more or less complete inability of the patient to hear such words as "messer," "teller," "Friedrich," etc., words of high pitch, speaks for the latter.—W. A. L.